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THE WORK OF THE U.S. FOREST SERVICE

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No. 290
MISCELLANEOUS PUBLICATION
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UNITED STATES DEPARTMENT OF AGRICULTURE

MISCELLANEOUS PUBLICATION No. 290

Washington, D. C. January 1938

WORK OF THE UNITED STATES FOREST SERVICE[1]

Prepared by the *Forest Service*

CONTENTS

	Page
Introduction	1
The national forests	3
Forests created from public domain	4
The purchase of forest lands	5
Wise use—the guiding principle	6
Management of timber resources	8
Range resources and their use	10
Protection of our watersheds	10
Recreation opportunities and facilities	12
Primitive areas are maintained	13
Conservation of wildlife	13
Receipts and their use	15
Improvements in the forests	16
Reforestation by planting	18
Protection of national forests	19
State and private cooperation	22
Better management of private forests	22
State aid under the Clarke-McNary law	23
Prairie States forestry project	24
Land acquisition for State forests	26
Other cooperative programs	26
Forest and range research	26
Management and protection	27
Forest influences	29
Forest products	29
Forest economics	30
Range investigations	31
Experimental areas	32
Civilian Conservation Corps	33
Other emergency projects	35
Information on forestry	35
Forest Service organization	36

INTRODUCTION

Forest depletion, which went on in the United States practically unchecked for more than 100 years, received its first real curb at the turn of the twentieth century.

The need for a conservation policy had been felt for a long time, but it was not until increasing demands of a rapidly expanding civilization sharply accelerated the rate of forest use—and misuse—and emphasized this need tremendously that public opinion called for Federal action to halt the destruction of the forest resources.

It was apparent that things were happening to the forests. They were being logged without thought of future timber requirements; uncontrolled fires and excessive cutting were destroying the remaining timber, preventing natural reproduction of trees, and stripping important watersheds of their protective covering. In short, it was clear that the public itself, through its Federal Government, should take steps toward the proper management of areas of greatest influence upon public welfare and exert every effort toward extension of sound principles to forest management and use.

At this time also it was evident that a great advance had been made in the development of scientific forestry. Public-spirited citizens wished to apply this new knowledge in order to restore and maintain the usefulness of the country's forest lands.

[1] This publication supersedes Department Circular 211, Government Forest Work, issued in April 1922.

During the 15 years, beginning with 1890, the trend toward public forestry moved swiftly, culminating in 1905 with the creation of the United States Forest Service in the Department of Agriculture. The forest reserves, as national forests were then called—areas withdrawn from the remaining timbered regions of the western public domain—were placed under the management of the Forest Service.

The Secretary of Agriculture at that time commissioned the Forest Service so to manage these Federal properties that they would provide the greatest good to the greatest number of people "in the long run." This cardinal principle has been steadily adhered to in their administration through the years.

Forestry, as applied by the Forest Service, is concerned with the perpetuation and development of forests that they may continue their many benefits to mankind—furnishing wood and other products for man's use; preventing erosion of soil and regulating stream flow and water supply for irrigation, for power, for domestic use, and for control of floods; harboring wildlife; providing abundant opportunity for outdoor recreation. All of these contribute to what is perhaps most important of all—steady, gainful employment for a sizeable portion of the country's population, resulting in stabilized communities.

Instead of being handled under scientific methods as a crop, timber is often "mined." When forestry is practiced in timberland management, the mature trees are used as "earned interest," while younger, growing trees are left intact as the "capital stock." The economic and soil-protective values represented by a forest in a healthy growing condition are thus permanently maintained.

Since 1905 the area of the national-forest system has more than doubled and has been extended to the Lake States, and the East and South. Equally important to placing this increased area under intensive protection and administration, is the work of the Forest Service in cooperation with States and private timberland owners in the spread of forest protection and practice of sound forestry; research operations in forestry, range management, and wood utilization; and the provision of employment on a large scale in times of economic depression.

There still remains a vast amount of forestry work to be done in addition to managing the national forests already established. Recent studies indicate that more than 200,000,000 acres of timberland are so depleted, or so located, or of such value for public services that private management reasonably cannot be expected to meet the requirements of public interest therein, at least not without undue subsidy. Public acquisition and management of these lands, therefore, appears to be the most feasible course. A fair share of this job for the Federal Government, considering the financial ability of the States, appears to be a little more than half of the entire job.

Moreover, it becomes increasingly clear that Federal aid to State and private forest owners, and perhaps some degree of regulation, are needed to meet, adequately, the interest of the Nation as a whole in the management of other forest lands as well.

Throughout the forest areas there is a large task of making the forests contribute more fully to the solution of the problem of rural poverty and to the development and maintenance of a satisfying rural

culture. Integration of forest work with part-time farming to provide an adequate livelihood for people living on the small farms of the forest regions is an example of this type of adjustment.

In summary, the work of the Forest Service is directed toward determining and applying measures for making our woodlands and related wild lands contribute in fullest degree to the lives of our people and to the solution of various national problems.

Government forest work had its real beginning as far back as 1876, with the appointment by the Department of Agriculture of a special agent to study general forest conditions in the United States. In 1881 a Division of Foresty was created in the Department, but for a long time it received an annual appropriation of less than $30,000, and could be little more than a bureau of information and advice. The Division grew from this small beginning into the Bureau of Foresty (1901), and finally, as its field of work expanded, into the Forest Service (1905).

FIGURE 1.—Forested watershed, Pisgah National Forest, N. C. On mountainous slopes like this tree growth conserves water, prevents erosion.

THE NATIONAL FORESTS

National forests are for the most part located in the mountainous regions of the country. Here preservation of tree growth is of great importance in preventing or retarding soil erosion and in conserving the waters for use of mankind.

These timbered Federal properties extend from the hardwoods of the southern Appalachians to the spruces of the White Mountains in New England; from the pinon and juniper stands where tree growth begins in the southern Rockies of New Mexico to the pine and fir forests along the Canadian line in Montana and Idaho; from the brush-covered foothills of southern California to the great conifer stands of the Olympics and Cascades in northern Washington. Even

along the Alaskan shore, where valuable Sitka spruce and hemlock growth clothes the lower flanks of the coastal mountains, are the Tongass National Forest, extending from the southern tip of the Territory northward, and the Chugach National Forest, which is within sight of Mount McKinley.

Timber, water, forage, wildlife, recreational features, and other resources of the national forests are for use of the people. The timber contributes to the industrial enterprises through a yearly cut of more than a billion board feet of lumber. The vegetative cover protects against erosion watersheds that are the source of about one-third of our potential water power, and helps insure pure and abundant water supplies to hundreds of towns and cities. The forage furnishes seasonal grazing for about 12,350,000 head of livestock of all ages. Fish in thousands of miles of mountain streams and big-game animals numbering approximately 1,600,000 head provide enjoyment for those who love the out of doors, and in addition there are many small fur bearers and game birds. Roads and trails and other improvements have made accessible superb vacation places and created in the forests a vast playground for increasing millions of recreation seekers.

FORESTS CREATED FROM PUBLIC DOMAIN

About 50 years ago the forests on the public domain seemed in a fair way to be eventually destroyed by fire and reckless cutting. Nothing was being done to protect them or even to use them in the right way. They were simply left to burn or else to pass by means of one or another of the land laws into the hands of private owners whose interest in most cases impelled them to take from the land what they could get easily, and then abandon it.

Congress recognized the situation that was developing and in 1891 authorized the President to set aside forest reserves, as the national forests were for some years called, in order to protect the remaining timber on the public domain from destruction and to insure a regular flow of water in the streams. The first forest reserve—the Yellowstone Park Timberland Reserve—was created by President Harrison that same year. Later Presidents have created others, until at present there are about 160 national forests with a total net area of about 174,000,000 acres located in 40 States and 2 Territories. There are still millions of acres of public domain that should be in national forests.

The original act made no provision for administering the forests, and the withdrawal of the land involved from all forms of settlement met with vigorous disapproval, especially in the West, where most of the reserves were situated. These defects, however, were largely removed by Congress on June 4, 1897, in a law outlining a system of organization and management for the reserves and placing their administration under the Secretary of the Interior.

Government administration of the reserves required the application of scientific forestry. Timber cutting had to provide for the growing of a new timber crop. The ranges had been seriously injured by unrestricted grazing and it was necessary to devise methods for increasing the forage crop. Both timber use and grazing use

had to be so managed that watersheds would be adequately protected. All the resources of the forests needed to be given careful consideration and plans devised for their best development. Technical problems were involved which the officials of the Department of the Interior felt to be outside their province. They, therefore, at first requested the aid of the experts of the Department of Agriculture as advisers and soon recommended the transfer of administration of the reserves to the latter Department where a Bureau of Forestry already was in existence.

The transfer of administration of the reserves took place in 1905. In 1907 the name "forest reserves" was changed to "national forests", by act of Congress to indicate that the resources of these areas are not locked up as "reserves" for a distant future.

F-331175

FIGURE 2.—Bonita ranger station on the Lolo National Forest, Mont., showing the dwelling, cook house, and office, and other buildings.

THE PURCHASE OF FOREST LANDS

By the time the national-forest movement began virtually all of the public domain within States east of the Great Plains, except some inferior remnants, had passed to State or private ownership. Indeed, within the present limits of the Thirteen Original States there was no public domain. The poor lands remaining in Federal control in the entire area were inadequate to meet public needs.

The purchase of additional lands valuable for the protection of the headwaters of navigable streams or for timber production, and their reorganization as national forests were therefore authorized by Congress, first by the act of March 1, 1911, called the Weeks law, and later by the amendatory act of June 7, 1924, known as the Clarke-

McNary law. The system of national forests is being constantly enlarged through purchase of privately owned lands under the provisions of these laws.

Lands are not purchased indiscriminately nor in relatively small tracts widely distributed over large territories. Such a practice would increase the costs of protection, development, and administration beyond practical limitations.

Purchases are confined to specific and definitely bounded areas within which the Federal Government can expect to ultimately acquire all of the lands except those which are more valuable for other purposes than for forest uses. The average area of the purchase units established to date is slightly more than 400,000 acres, and an area in which it will not be practicable to acquire at least 100,000 acres in reasonably compact form ordinarily is not considered.

The general policy is to purchase only those lands which are voluntarily offered by the owners. There is no exercise of the right of eminent domain or condemnation, except by agreement with the landowners as a means of quieting titles. The fact that private lands may be within a national forest in no way affects the use and management of such lands, so long as it does not result in injury to adjoining Federal properties.

On January 1, 1937, there were 87 established purchase areas; 3 in New England, 11 in the Appalachian region, 2 in the piedmont area of North and South Carolina, 20 in the southern pine region, 25 in the Ozark and central Mississippi States, 16 in the Lake and upper Mississippi region, 9 in the Western States—Utah, Idaho, California, and Oregon—and 1 in Puerto Rico.

Purchase work is conducted under direction of the Secretary of Agriculture, but no land may be paid for unless its purchase has been approved by the National Forest Reservation Commission, which consists of the Secretary of War, the Secretary of the Interior, the Secretary of Agriculture, two Members of the Senate, and two Members of the House of Representatives.

Development of the national-forest system, especially in the eastern half of the United States, was speeded up by purchase of land under the emergency relief programs. Nearly $45,000,000 of emergency funds were allotted this purpose during the years 1933 to 1935, thus permitting the purchase of almost 11 million acres additional to those previously acquired. These purchases have opened up large reservoirs of constructive public work for the relief of the unemployed.

WISE USE—THE GUIDING PRINCIPLE

The policy under which the national forests are administered by the Department of Agriculture through the Forest Service was laid down by the Secretary of Agriculture in a letter to the Chief Forester, dated February 1, 1905, in which he said:

> In the administration of the forest reserves it must be clearly borne in mind that all land is to be devoted to its most productive use for the permanent good of the whole people and not for the temporary benefit of individuals or companies.
>
> All the resources of the forest reserves are for use, and this must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources. * * * You will see to it that the water, wood, and forage of the reserves are conserved and wisely

used for the benefit of the home builder first of all, upon whom depends the best permanent use of lands and resources alike. The continued prosperity of the agricultural, lumbering, mining, and livestock interests is directly dependent upon a permanent and accessible supply of water, wood, and forage, as well as upon the present and future use of these resources under businesslike regulations enforced with promptness, effectiveness, and common sense.

F-238984

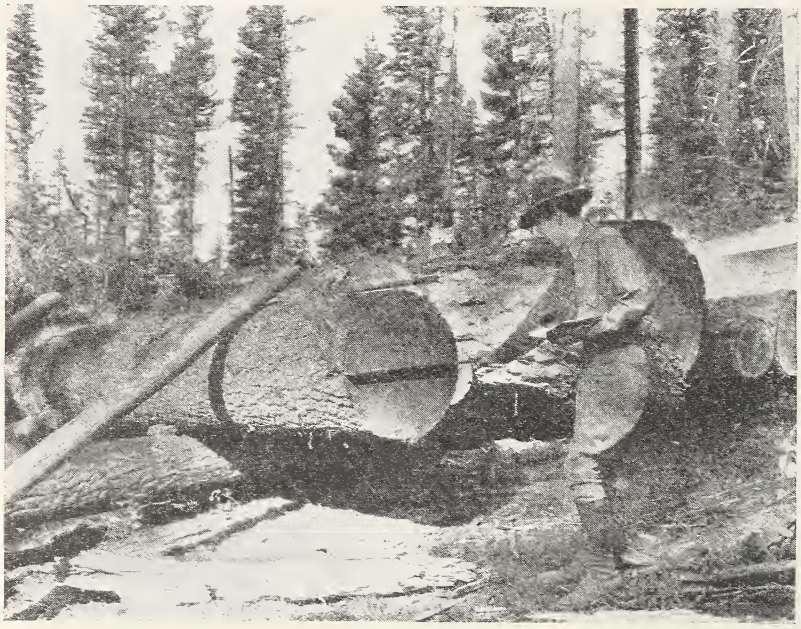
FIGURE 3.—One of the mean jobs in Forest Service work is fighting fire. It isn't romatic. It is hard, hot, suffocating, dangerous labor.

In the management of each reserve local questions will be decided upon local grounds, the dominant industry will be considered first, but with as little restriction to minor industries as may be possible; sudden changes in industrial conditions will be avoided by gradual adjustment after due notice, and where conflicting interests must be reconciled the question will always be decided from the standpoint of the greatest good to the greatest number in the long run.

Lands which are more valuable for agriculture than for forestry purposes have been excluded from the national forests either by changes in the forest boundaries or by being opened to settlement and entry under the Forest Homestead Act of June 11, 1906. The act of August 10, 1912, which directed that the national-forest lands

be classified for the purpose of determining those which are chiefly valuable for agriculture, has resulted in practically all agricultural lands within the national forests being homesteaded.

Mineral deposits within national forests, except such forests as are purchased under the act of March 1, 1911, are open to development exactly as on unreserved public land unless otherwise provided by special acts of Congress.



F-253404

FIGURE 4.—Forest officer scaling timber on the Idaho National Forest.

MANAGEMENT OF TIMBER RESOURCES

Ripe standing timber on the national forests is sold at a fair price. Anyone may purchase timber, but no one may obtain a monopoly of it or hold it for speculative purposes. It is desirable to sell the mature timber on the forests when it is no longer growing at a profitable rate and should give way to younger trees and seedlings which will constitute succeeding crops of timber. Not all timber in the national forests is subject to sale. Wherever trees have a higher value for scenic, recreational, or other uses, they are preserved.

Purchasers of timber are required to observe such restrictions as will insure cut-over areas being left in the best condition for future growth. Experienced foresters estimate the quantity and quality of national-forest timber and its approximate value. In fixing the value all factors which affect the cost of lumbering, such as accessibility, number and kind of improvements necessary, as well as general market conditions, are taken into account. Minimum prices are then set which allow the purchaser of national-forest timber

opportunity for a fair profit. Unless the amount is small, the timber is then sold through public advertisement to the highest bidder.

Before an extensive program of timber sales is started forest officers make a careful survey of the timber resources and prepare a plan of management prescribing the amount of timber which may be cut annually or by other short periods and the methods and order of cutting. These long-time plans are made in order to insure a constant supply of timber for the communities and industries dependent upon the forest for raw materials. This makes possible the establishment of permanent wood-using plants and prosperous communities of people who look to the woods as a market for their labor.

The trees to be cut on a sale area are usually marked in advance by a forest officer, the object being to leave enough trees to seed the

F-196693

FIGURE 5.—Timber-sale area on the Sitgreaves National Forest, Ariz.

ground or younger trees to form the basis of a second crop of timber on the same land. Where the forest protects a watershed, no cutting is done that would injuriously affect stream flow or start or increase erosion, nor is mature timber taken from recreational areas where it has a special value for scenic purposes.

Small sales of timber are made by the local ranger. Larger sales are made either by the supervisor of the forest, the regional forester, or the Chief of the Forest Service.

National forests also serve local people in supplying needed timber. Settlers, farmers, and other bona fide residents may obtain free timber for their own use for such domestic purposes as firewood, fencing, and building, where the taking of such material aids in protection and improvement of the forest. They may also obtain higher grade material when needed by paying the costs of making the sale.

RANGE RESOURCES AND THEIR USE

Along with the timber in the national forests, particularly in those of the West, there is a great deal of grazing land which is used every year by about 5,700,000 sheep and goats and 1,500,000 cattle, horses, and swine. If the 5,150,000 young of all kinds (which are not counted or charged for) are added, the total number of domestic animals which graze annually in the national forests is now about 12,350,000.

Resident settlers and stockmen are given first consideration in the granting of the grazing privileges. Each permit specifies the number of stock which may be grazed during a stated period and the portion of the forest on which they are to be grazed.

F-36039

FIGURE 6.—Cattle grazing on high summer range, Grand Mesa National Forest, Colo.

Range administration involves the protection, development, and management of the forage resource in such a way as to allow its fullest use consistent with permanent maintenance. Forage on the national forests is important to many engaged in the livestock industry and is the basis for the establishment and maintenance of homes and communities. A good supply of forage year after year can be assured only by not allowing the land to be overcrowded with stock or to be grazed too early in the season. Under regulation, overgrazed range is improved, instead of being further damaged or denuded.

PROTECTION OF OUR WATERSHEDS

Vegetation—forests, grasses, and brush—covering mountain ranges and other large areas of the country, exerts a powerful influence upon regularity of water supplies. Water for domestic and industrial

uses and for irrigation comes, in many cases, from rain and snow falling on the mountains and hills. Here also are the headwaters of many of our navigable rivers. Congress, therefore, made the preservation of conditions favorable to stream flow one of the principal objects in the establishment and administration of the national forests.

It has been increasingly apparent that upon the condition of the watersheds depends the stability of many communities. The relationship of watershed protection to floods and electric-power genera-

F-243245

FIGURE 7.—The woodland bed of a mountain stream, Wagner Falls, near Munising, Mich.

tion has been brought into sharper focus by events of recent years that have emphasized the importance of a vegetative cover over wide areas.

Permanent operation of power plants depends in large measure upon regularity of the water supply and the checking of silting. Along the streams within the national forests are many sites suitable for power development. These are open to occupancy for such purpose. The Government does not permit monopolization of power, however, in any region or allow power sites to be held on national-forest land without prompt development. Where scenic or other values outweigh the value of a particular site for power, the principle of greatest use to the greatest number operates to preserve the site for the larger purpose.

A well-kept forest is the best of natural soil holders and is Nature's great water reservoir. Where there is no vegetation, particularly on steep slopes, there is nothing but the friction of the soil to keep water

from going downhill as fast as it can and carrying much of the soil with it. Forests and well-sodded pastures hold back more rain water and more soil on steep slopes than denuded woodlands or overgrazed ranges.

Foresters know that the preservation of vegetative cover on watersheds will not absolutely prevent floods. Their research findings and observations do demonstrate that the retarding effect of such cover can greatly lessen the amount of run-off pouring into tributaries and main stream channels during a short period. Also, they

F-308555

FIGURE 8.—Island Lake Camp, Shoshone National Forest, Wyo.

know that by affording adequate protection to the soil, much silt can be kept out of the rivers. Forests, therefore, exert two powerful controls on the height of flood crests.

In any national plan for flood control, forestry will play an important part. Good forestry practices may be used with other soil-conserving and water-holding measures to help control the waters at their sources. Engineering works, such as dams, dispersion basins, levees, and spillways, may provide down-stream protection. The Forest Service in company with other bureaus within the Department, is represented on the Flood Control Coordinating Committee of the Department of Agriculture.

RECREATION OPPORTUNITIES AND FACILITIES

Campers, sportsmen, and seekers after health, rest, and recreation find that the national forests offer unrivaled opportunities for outdoor life and enjoyment. Popularity of these great mountain

playgrounds is evidenced by the increase in number of persons passing through them from a few more than 3 million in 1917 to more than 71 million in 1936. These figures, of course, include "repeaters" and those who visit more than one national forest.

Roads and trails, marked by signs, make the forests reasonably accessible. Public campgrounds have been established in localities frequented by large numbers of people. Water facilities, fireplaces, and comfort stations are being constructed for the convenience of visitors as rapidly as available funds permit.

The national forests are the home of the country's big game. There are also many excellent trout streams and lakes, frequently restocked with fish, which offer keen sport to the angler. In general, the only restrictions on hunting and fishing are those imposed by the fish and game laws of the States in which the forests are located. All that is asked of the visitor is that he look to the proper sanitation of his camp and be careful with fire.

Permission to occupy national-forest land for residential, commercial, or industrial purposes not unfavorable to the protection and management of the forest may be obtained under special-use permits granted upon payment of moderate fees. Detailed information may be obtained upon application to the forest supervisor.

PRIMITIVE AREAS ARE MAINTAINED

Within the national forests a number of primitive areas have been established. Here primitive conditions of environment, transportation, habitation, and subsistence are maintained with a view to conserving permanently the value of these lands for purposes of public education and the pioneer type of recreation.

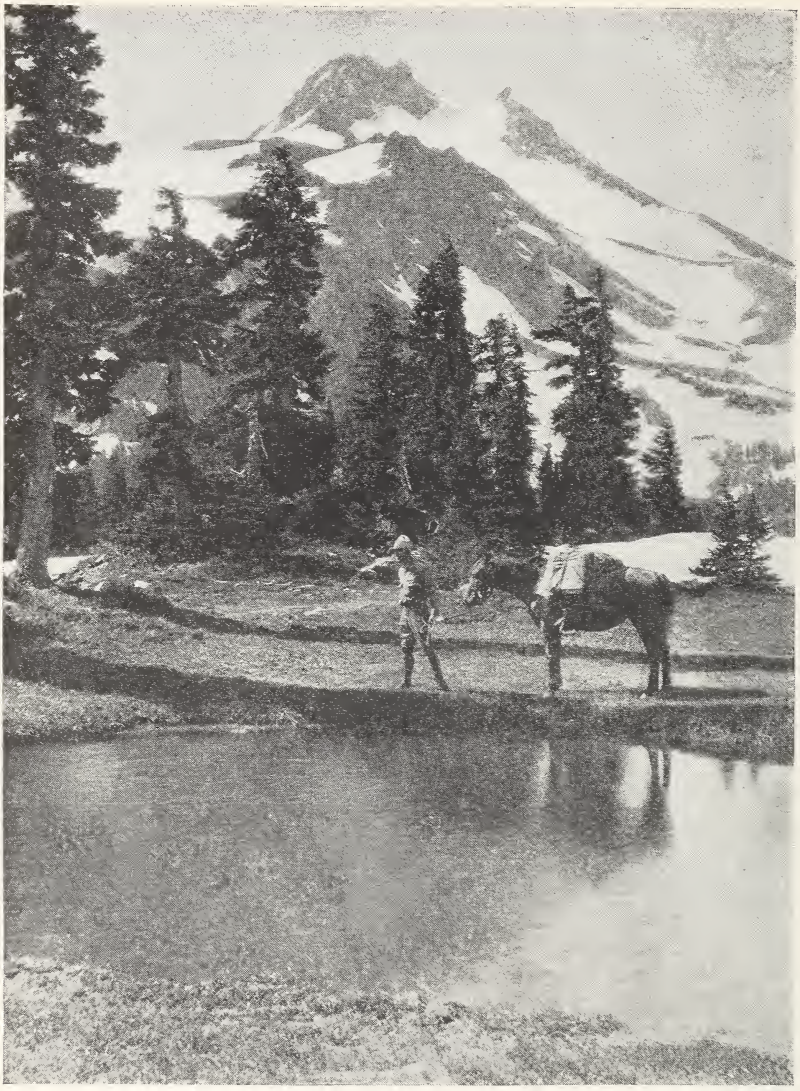
The Forest Service intends, in maintaining primitive areas, to preserve unique natural values and to give the public opportunity to experience the conditions which existed in the pioneer days of the Nation's development, and to engage in the forms of outdoor recreation characteristic of that period.

CONSERVATION OF WILDLIFE

The national forests are becoming increasingly important in preserving and restoring one of America's basic resources—wildlife. They aid in maintaining opportunity for the public to enjoy the aesthetic, scientific, and social pursuits that are based on adequate populations of game animals, birds, and fish.

Wildlife is considered by the Forest Service as a resource to be managed for permanent protection and use, as are other national-forest resources. The total national value of this economic resource is estimated at more than $1,000,000,000 annually. Through the practice of scientific wildlife management, aided by research findings of the Bureau of Biological Survey, the aim is to develop and maintain this resource on a permanent basis.

In the West as a whole, almost 75 percent of the remaining big-game summer ranges are now within the national forests. And, despite the fact that the number of persons passing through the national forests, fishermen and hunters included, increased from 3,000,000 to 71,000,000 over a 20-year period, the number of big-game animals on the national forests increased an estimated average of about 140 percent between 1924 and 1937.



F-265923

FIGURE 9.—Mount Jefferson Primitive Area, in Deschutes and Willamette National Forests, Oreg. There are some 110 lakes within the area and in the spring a profusion of wild flowers. A spectacular feature is Mount Jefferson, a giant snowcap crowned with perpetual glaciers, rising to almost 10,500 feet above sea level. The timber here, which consists principally of Douglas fir, western hemlock, and mountain hemlock, is mainly valuable from a watershed and botanical standpoint.

Cooperation of the Forest Service with the State and local authorities in enforcing the game laws has contributed in no small degree toward making the national forests more attractive to visitors and conserving their valuable wildlife resources. Special acts of Congress have designated a number of national game refuges, situated wholly or in part within national forests, for the protection of wildlife. Many State game refuges also have been designated.

RECEIPTS AND THEIR USE

Receipts from the national forests from timber sales, grazing fees, special land uses, water power, and other sources amount to more than $4,000,000 each year. Normally, receipts from timber sales form the larger part of the total, with receipts from use of forage a close second.

It could not be expected, of course, that rugged, relatively inacessible mountain lands, such as constitute by far the greater part of the national forests, would soon yield a revenue to the Government over and above the cost of administration. Many of the forests may be

F-280508

FIGURE 10.—Bear-den tree and the tenant himself. Monongahela National Forest, W. Va.

expected to help supply the country's future needs for timber after the more accessible lands have been cut over, rather than its present needs. Others are chiefly valuable for watershed protection, which, though of greatest importance to the people and industries of the country, does not yield the Government direct return in dollars and cents. Moreover, a great deal of money must be spent for roads, trails, bridges, telephone lines, and other improvements before the resources of the forests can be used.

Since Federal property is not taxable, 25 percent of the total net receipts of the national forests is turned over each year to the States to be apportioned for road and school purposes to the counties in which the national forests are located. An additional 10 percent is used for road and trail building on the national forests, so that 35 percent, in all, of the receipts returns directly to benefit the local national-forest communities. Also, many of the expenditures by the Forest Service for national-forest protection and improvements aid in local development.

IMPROVEMENTS IN THE FORESTS

Making the national forests fully useful to the public, and also facilitating their administration and protection as Government properties, requires that they be equipped with various classes of improvements. Some of these are primarily for official use, as for example, fire lookout stations, ranger stations, and telephone lines.

F-211642

FIGURE 11.—Cold Knob Fire Tower. Allegheny National Forest, Pa.

Other improvements are purely for the specific benefit of the public, as for example, drift fences, stock-watering places, and public campgrounds. Still others, such as roads, trails, and stock driveways, are put in both to facilitate the task of administering and protecting the forests and to serve the interests of the public generally.

The Forest Service cooperates with State and county officials, good-roads organizations, and private individuals in the location, survey, construction, and maintenance of roads in the national forests. The road- and trail-construction work is ordinarily financed from regular appropriations made by Congress, but money has also been made available by allotments of emergency funds.

Through cooperative arrangement the highway projects which require the supervision of engineers intensively trained in highway engineering and construction are handled by the Bureau of Public Roads. The construction, repair, and maintenance of truck trails required primarily for administrative, utilization, and protective purposes on the national forests, together with the building and

F-281481

FIGURE 12.—Telephones are highly essential in fire prevention on national forests.

maintenance of foot and horse trails, are handled directly by the Forest Service. Such work is coordinated with fire control, whenever possible, so that construction crews may be available as part of the fire-suppression organization in remote areas of great fire hazard.

Up to June 30, 1937, the construction or improvement of 21,918 miles of forest highways, 80,568 miles of development roads and truck trails, and 138,496 miles of trails had been made possible from direct forest road appropriations and other Federal and cooperative funds apportioned to States. More than $294,000,000 of Federal funds has been spent on this work in the history of the Forest Service.

Complete and economical use of the forage on the forests sometimes makes necessary development of water supplies or construction

of drift fences, bridges, trails, or other works. The Forest Service allots funds for such construction when the benefit to the forest plainly warrants the expenditure. Local stockmen frequently cooperate in the development of these improvements.

REFORESTATION BY PLANTING

Many of the national forests, particularly those recently acquired in the Lake States and the South, include areas that were devastated by heavy logging and repeated forest fires prior to their establish-

F-222257

FIGURE 13.—Forest Service trail on the Medicine Bow National Forest, Wyo.

ment as national forests. When devastation is so complete that desirable types of forest growth cannot be expected to return naturally, it is necessary to plant trees on these areas in order to restore protective cover to watersheds and to return them to forest productivity as soon as possible. Because nursery-grown trees are better able to survive, most planting is with tree seedlings grown in Forest Service nurseries, rather than by direct field seeding.

Increased capacity of Forest Service nurseries has enabled planting operations to be greatly expanded in recent years. More than a score of tree nurseries, staffed with trained nursery technicians, and producing young trees by the millions suitable for planting in the various national-forest regions are now being maintained.

During the period 1934–36, an annual average of more than 144,000 acres in the national forests were reforested. In terms of trees, this represents a total planting over the 3-year period of more than 400 million trees.

PROTECTION OF NATIONAL FORESTS

Fire is an ever-present danger on the national forests. The great size of the forests compared with the size of the patrolling force, difficulty of reaching remote areas across miles of wilderness, dry air, and light rainfall in parts of the West, prevalence of lightning in the mountains, and constant use of fire in the daily lives of

F-281525

FIGURE 14.—Crew constructing buttress for bridge across Elder Creek in the Fremont National Forest, Oreg.

people and in industries all combine to make the fire hazard great. Visitors also contribute to the danger. Sometimes the Forest Service has to fight 10,000 or more fires within national-forest boundaries in a single year.

Among the chief causes of fire on national forests are lightning, smokers, incendiarism, campers, debris burning, lumbering operations, and railroads. Sixty-three percent of forest fires within the national forests are man-caused.

Even a small fire may spread into a conflagration. Care with fire, matches, and burning tobacco is the first rule observed by every good woodsman. Fires may start in a remote locality and reach vast proportions before a party of fire fighters can get to the scene, no matter how promptly the start is made. Under particularly dry weather conditions, the forests may be said to be almost explosively inflammable. Because of this, the Forest Service lays tremendous stress upon forest-fire prevention. It is much cheaper to prevent fires than to fight them once they start.

During the danger season forest supervisors and rangers concentrate their efforts to prevent fires and to catch, while still small, those that do start. Extra men are employed, the forests are systematically patrolled, and a careful lookout is maintained from towers and stations on high points.

Roads and trails are being built so that all parts of the forests may be quickly reached. The ranger stations and lookouts are connected with the offices of the supervisors by telephone, so that men may be quickly assembled to fight fires which the patrolmen cannot subdue alone.

F-270736

FIGURE 15.—Using his alidade the guard has located a forest fire. He is reporting it by telephone to the nearest ranger station, Coeur d'Alene National Forest, Idaho.

Tools and food supplies for fire fighters are stored at convenient places. Service of supply is also being augmented by a new development in fire-fighting technique—the use of aircraft. The Forest Service owns no airplanes, but charters them from commercial concerns when need arises.

Experiments have resulted in development of standard methods of dropping equipment and supplies to fire fighters from airplanes. Special packaging and the use of simple parachutes constructed in a few minutes from easily obtainable material have made this possible. Valuable time is thus saved in supplying ground crews operating far from supply bases.

Aircraft are used also in scouting and patrolling large fires, and to aid in detection during periods of extremely low visibility. The system of lookouts is far more effective, however, for general fire detection.

Many of the national forests, particularly those of the West in which fire danger is great and communication difficult, have been equipped with portable short-wave radio sets of a special type developed by the Forest Service. Radio provides communication with fire-fighting units after they have left the base station and are away from telephone facilities. On large fires these portable sets enable the fire chief to keep in close touch with progress of the fire and to make the most intelligent use of man power and equipment.

F-312669

FIGURE 16.—Patrolman using Forest Service field radio set on lookout point. Portable map board and alidade are strapped to tree. Lolo National Forest, Mont.

Weather observations are made regularly at numerous Forest Service stations. Forecasts of "forest-fire weather" are sent by the Weather Bureau to forest officers so that when critical conditions are indicated, special preparation can be made to meet them.

HEALTH PROTECTION

Precautions are taken by forest officers to protect the public health. All persons using national-forest lands are expected to properly dispose of their refuse, leave clean campgrounds, and refrain from polluting waters. They are liable to trespass proceedings if insanitary conditions result from their presence. Forest officers enforce compliance with regulations on the part of all campers, stockmen, permittees, and other persons traveling through or occupying national-forest lands.

FOREST INSECTS

Aggregate losses in the forests of the United States from insect damage are enormous. The principal forest insect pests are bark

beetles and defoliating insects. Among the first group are the western pine beetle, the mountain pine beetle, the Black Hills beetle, the Engelmann spruce beetle, the southern pine beetle, and the eastern spruce beetle. The gypsy moth, the spruce budworm, and the larch sawfly are serious defoliating insects. Beetle outbreaks frequently follow forest fires when, because of damage by burning, the trees' powers of resistance are low.

Where insect attacks reach epidemic proportions on the national forests, control measures are undertaken in cooperation with the Bureau of Entomology and Plant Quarantine. Experimental work in insect control also is carried on in cooperation with this bureau.

TREE DISEASES

Tremendous losses of timber and young growth are caused by tree diseases, such as the white-pine blister rust. Some of the most destructive tree diseases have been imported from other countries on planting stock. Efforts are now being made to combat those already imported and to prevent, by quarantine, the importation of new diseases.

In its control work against tree diseases in the national forests, the Forest Service is aided by the Division of Forest Pathology, Bureau of Plant Industry, and the Division of Plant Disease Control, Bureau of Entomology and Plant Quarantine, Department of Agriculture. The Division of Forest Pathology maintains pathologists in several of the regional offices and forest experiment stations of the Forest Service.

STATE AND PRIVATE COOPERATION

Paralleling in importance the administration of the national forests is the work being done by the Forest Service in cooperation with State and private forest-land owners toward better management of American forests as a whole. The importance and extent of such operations is clearly seen in the fact that there are in the United States more than 426,000,000 acres of land under State and private ownership, chiefly valuable for the growing of timber. It is apparent that the manner of utilization of these areas profoundly affects the social and economic conditions of a large percentage of American citizens and communities. The Forest Service, through its branch of State and private forestry cooperation, is endeavoring to bring about on these lands the sort of utilization that will have the most favorable effect on the public welfare.

BETTER MANAGEMENT OF PRIVATE FORESTS

Management under the principle of sustained yield, which enables forest lands to produce tree crops indefintely, is necessary if the social and economic values of our forest lands are to be permanent. That this principle is workable has been proved in the management of the national forests. Extending it to all American forests and woodlands is the logical goal. In the interests of American democracy, of which the free and independent ownership of land is so much a part, the extension of management designed to perpetuate the means by which such ownership can be maintained is a vital necessity.

A specific example of need for extension of sound forestry management into private forest lands may be seen in the Southern States. In this region there is a capital investment of approximately $150,000,000 in the form of pulp and paper mills dependent upon forests for raw material. About 800,000 people are dependent upon the industry. Operating in the area are more than 10,000 sawmills and a tremendous naval stores industry. Such forest byproducts as telephone poles and railroad ties also add to the timber income.

If the second-growth timber on which these southern industries largely operate is cut out with no consideration of future forest production, a vast area will gradually be turned from an economic asset into an economic liability. It could then be anticipated that in the South, as has already occurred to greater or less degree in some other regions, a vast area would be left tax-delinquent and devastated, with the social and economic evils attendant upon such a condition. The need for wise forest management aimed at establishing a basis for the support of a permanent prosperity is obvious. This is the type of problem, with variations in regional, industrial, and economic backgrounds, that the Forest Service, through cooperation with State forestry departments and private woodland owners, is attempting to solve.

Definite progress has been made. Several basic fields of action have been established. Protection of forest lands against fire is perhaps the most important task, for fire ruins timber values, destroys reproduction of trees, and makes necessary extensive planting programs to return burned-over lands to productivity.

STATE AID UNDER THE CLARKE-McNARY LAW

The Federal Government offers financial aid to some 38 States and Hawaii under provisions of the Clarke-McNary law of 1924 to bring private and State-owned forest lands under protection from fire. The importance of this aid is seen in these figures: More than 41,000,000 acres of forest land other than that in Federal ownership is burned over annually. Of this, by far the greater part—some 38,000,000 acres—is upon unprotected land. The area covered by cooperative protection was, in 1936, some 283,000,000 acres, or only slightly more than half of the total area needing protection. The Forest Service is working to increase the area under organized protection.

Funds allotted by the Federal Government for fire-prevention work during 1937 totaled $1,655,007; State and private funds budgeted for the same period were $5,622,464. Cooperative fire-prevention projects are administered by the State forestry departments, aided by the Forest Service in developing plans and inspecting the work. Under terms of the law, the Federal Government limits its expenditures in a given fiscal year to a sum not greater in each State than the funds expended by the State and private owners. Federal allotments in no case may be more than 25 percent of the estimated cost of adequate protection of forest lands in the State.

The Federal Government also cooperates under the Clarke-McNary law with State and private forest owners in the reforestation of areas in 40 States, Puerto Rico, and Hawaii. Approximately 36,000,000 trees were distributed in 1936. This stock is distributed by State

forestry departments or comparable agencies for the planting of windbreaks, shelterbelts, and farm woodlands.

Another form of assistance offered by the Government under the Clarke-McNary law is aid to farm woodland owners in the management and care of their timber. Approximately 185,500,000 acres of commercial forest land, or about one-third of the privately owned commercial forest area of the country, is in farm woodlands. As a source of cash income to the farmers of the United States, forest products sold from the farm rank ninth among the 50 leading farm crops. In this project, the Department of Agriculture, through its Extension Service and the Forest Service, cooperates with farmers in 37 States and Puerto Rico. The work is focused on the more efficient management of farm woodlands, the reforestation of those farm lands not now suitable for agricultural crops, and the marketing and utilization of farm timber.

In connection with this program, a number of small timbered tracts throughout the country are being improved as demonstration areas to stimulate the interest of timberland owners in practical forestry methods. Civilian Conservation Corps enrollees are being used in carrying out this work on both farm woodlands and other privately owned timberlands. Each demonstration is a cooperative venture in which the owner of the land, the C. C. C., the Extension Service, the State forest service, and the United States Forest Service participate. These demonstrations show practical measures of controlling soil erosion, reducing flood dangers, and increasing forest and woodland values through proper woods practices. They also aid in promoting more intensive protection from fire.

PRAIRIE STATES FORESTRY PROJECT

The Forest Service is vitally concerned with the use of trees in the prairie-plains States as an important means in the control of wind and water erosion and as a means to make that area a better place in which to live and work. Planting programs are designed to extend windbreak, shelterbelt, and farm-woodland benefits into the territory between the forested States along the Mississippi and the treeless plains to the west.

Preliminary activities have proved the value of such work. Outstanding success was attained in the planting programs under the Prairie States forestry project of 1934–36. Work was done in an area extending from the northern boundary of North Dakota south into the Panhandle of Texas, and approximately a hundred miles wide.

Trees selected for planting were for the most part the native species of the western region which have become adjusted to the climate and soils through many generations. In the case of every species except exotics, special stress was laid on the collection of seed and propagation of seedlings within the region and the latitudinal zone in which the trees were planted.

Nurseries were established to provide the necessary seedlings. During 1935 and 1936, nearly 24,000,000 trees were planted on the project, representing approximately 1,278 miles of shelterbelt strips, in addition to approximately 6,500 acres of tree groves planted around farmsteads.

F-303250

FIGURE 17.—Cottonwood planting crew in action in South Dakota; 1-year seedlings are being planted 4 feet apart in rows 8 feet apart.

F-334655

FIGURE 18.—When planted on an Oklahoma farm March 5, 1936, these cottonwoods were 1-year seedlings. The photo was taken November 10, 1936. The trees are growing into an effective shelterbelt designed to keep sand from a river bed from being deposited on a valuable field.

Shelterbelts provide protection from winds in a region where natural means of protection are largely lacking. They serve also as snow traps and furnish shade. The trees help to prevent the quick drying and subsequent "blowing" of soils by checking the velocity of the winds. Similarly they protect growing crops from critical

drying winds. Through other local effects, trees so grown modify their immediate environment and the living conditions for man, beast, bird, and vegetation.

LANDS ACQUISITION FOR STATE FORESTS

The Fulmer Act of 1935 provided for Federal cooperation with States in the purchase of forest lands. Liquidation of Federal financial aid to the States will come from the sale of forest products from these lands. These areas will eventually become State-owned forests, but title may not be passed unless the State adheres to certain prescribed forestry practices.

The program calls for aid to the States in selecting productive lands so located as to serve the maximum public good. It is the hope that a system of State forests of somewhere near 30,000,000 acres will eventually be established that will be highly productive of all forest resources, and also that will serve as first-rate demonstrations showing the money and other returns that may be expected to result from the practice of sound forestry management.

OTHER COOPERATIVE PROGRAMS

The Forest Service also cooperates in naval stores conservation, the 1937 program having been approved by the Secretary of Agriculture for operation under the provisions of the Soil Conservation and Domestic Allotment Act. Participation by producers and operators is voluntary. All field and inspectional work is conducted by the Forest Service. Objectives of the program are promotion of economic use and conservation of land, prevention of wasteful use and exploitation of turpentine resources, and extension of forest-fire protection in the naval stores region.

Forest Service officers are also working with the Agricultural Adjustment Administration in examining private western range lands to determine carrying capacity. The Forest Service is thus cooperating with the A. A. A. in the establishment of suitable conservation practices for which benefit payments may be made.

FOREST AND RANGE RESEARCH

Basic in importance to the administration of the national forests, as to all timber and grazing lands in the country are the organized fact-finding and interpretive activities that comprise forest and range research. These activities, which cover the whole field of forest and range use, are classified under a few broad subjects: Forest management and protection, forest influences, utilization of forest products, management of livestock on forest ranges, and forest economics and taxation.

All lines of forest research head up in Washington, D. C., but by far the greater part of the investigative work is conducted at 12 regional forest and range experiment stations and at the Forest Products Laboratory, a national institution, at Madison, Wis. The territories of the experiment stations roughly correspond to the major forest regions of the country. Investigative results are made available for use not only on the national forests but also on other Federal, State, municipal, and private timberlands.

F-200914

FIGURE 19.—Thousands of tree seedlings in the Monument Nursery, Pike National Forest, Colo., ready for planting on burned-over and waste lands.

F-244068

FIGURE 20.—Pulpwood-thinning demonstration in loblolly pine, Virginia.

MANAGEMENT AND PROTECTION

The purpose of research in forest management is to discover and interpret the facts upon which rest the full productive management of forest lands for timber growing. Investigations conducted in all the

important forest types in the country are directed toward furnishing the owner of timberland, whether farmer or lumberman, State or Federal Government, information wherewith forest lands can be brought to the point of producing the highest returns and maintaining stabilized industrial communities.

Forest-management research includes a wide variety of subjects. How to obtain forest regeneration, artificial or natural, calls for studies of seed production and germination, nursery and planting

F-261571

FIGURE 21.—Forest officer using an increment borer for study of tree growth rate. Ouachita National Forest, Ark.

practice, and sprout and seedling growth. Genetics—for the development of improved quality, growth rate, or other characters—is being studied for forest trees just as it is by other agencies for livestock and crop plants. Intensive studies are made of thinning practice, of the growth rate of trees and stands, and of methods of harvesting the forest to obtain the best natural reproduction.

Research has an important place in forest-fire control. Planning for fire suppression is aided by studies of forest-fuel inflammability, weather conditions, and the development of fire-fighting equipment. Apparatus for detecting forest fires under different conditions of visibility is being devised or perfected. Fire damage, the recovery of

forests after fire, changes in the growth and quality of forests after recurrent fires, and many other related problems are being studied.

FOREST INFLUENCES

Closely coordinated with the research in forest and range management are investigations in forest influences. This research has for its purpose the determination of the effect that forests, brush, and other natural cover have upon water, soil, and climate. Studies are under way at a number of the forest experiment stations to determine these relationships and especially to work out the extent to which

F-278505

FIGURE 22.—Thinning lodgepole pine stand, Medicine Bow National Forest, Wyo.

the natural vegetation may be supplemented by minor engineering works and whether or not cutting of timber, grazing of livestock, and other uses of the forest and range cover affects adversely the water flow.

One major concern is the influence of forests on floods. Under the recent Flood Control Act the Forest Service has a very important part in the program of the Department of Agriculture in determining the measures which should be taken on the watersheds in order to provide for the control of water on the land. Foresters believe that if water can be controlled at the place where the rain falls, or the snow melts, such control will have a marked bearing upon other flood-control operations in the major waterways.

FOREST PRODUCTS

Research in forest products is designed to increase the value of the forest crop through improvements in wood utilization, the development of new uses for wood, and the utilization of waste and of tree

species now considered inferior or worthless. The work includes, for example, determination of the strength properties of wood, improved methods of fabrication and design, wood preservation by chemicals to prevent decay and decrease inflammability, painting and gluing of wood, pulp and paper making possibilities of various species, improved methods of seasoning, chemistry and chemical utilization of wood, and methods of selective logging to bring about the profitable and permanent management of forest properties.

The bulk of the work in forest-products research is centered at the Forest Products Laboratory at Madison, Wis., with some affiliated work at the California, Pacific Northwest, and Northern Rocky Mountain Forest Experiment Stations, and at Washington, D. C.

F-243564

FIGURE 23.—Norway pine plantation on the Huron National Forest, Mich.

FOREST ECONOMICS

Investigations in forest economics cover the entire range of economic and social problems involved in the production of forests and in the utilization of forest resources. They consist particularly of investigations of forest land and forest land management.

The series of correlated projects under way includes studies to determine the economic feasibility of timber growing; equitable methods of forest taxation; the possibility and principles of forest insurance; the extent of tax delinquency and reversion to public ownership of forest land and the practicability of remedial measures; and the collection, classification, and interpretation, in cooperation with the Bureau of the Census, of economic data on the production, distribution, consumption, and price of forest products.

A comprehensive survey of the forest resources and requirements of the whole country is now in progress. This is a nation-wide economic study of our forest-resource situation involving an inventory of the extent, location, and condition of forest lands; the quantity, kinds,

quality, and availability of timber now standing on these lands; the rate of depletion through cutting, fire, insects, disease, and other causes; the current and probable future rate of timber growth and the productive capacity of our forest area; and the present and probable future requirements for forest products in the different parts of the country by all classes of consumers, including many major industries. It includes analysis of the relation of these findings to one another and to other related social and economic factors as a basis for formulating policies, principles, and plans of forest-land management and use, both public and private.

F-253655

FIGURE 24.—Treating poles from the Wasatch National Forest, Utah.

RANGE INVESTIGATIONS

Range research furnishes the basis for sound management of forest and other range lands. Its objectives are to secure and supply Federal, State, and private agencies with basic information needed to perpetuate and improve all range-land values.

Range research is being carried on at the regional forest and range experiment stations in the West and in Washington. It is concerned primarily with three broad phases:

(1) Grazing-management studies, which aim to determine the grazing capacity and proper seasonal use of the various types of range, develop ways and means of maintaining and increasing forage and livestock production, improve methods of handling livestock on the range, control losses from poisonous plants, and to harmonize grazing with watershed protection, timber production, fire protection, wildlife, and other land values.

(2) Range-forage investigations, which involve the collection and analysis of information on the identity, distribution, life histories, and forage value, watershed, and other values of range plants.

(3) Artificial-reseeding investigations, which aim to determine what native species justify selection for improvement, the possibilities for the adaptation of native and introduced species to seeding or transplanting, and to determine how these plants can be most economically reproduced and established on range lands under the varying conditions of climate, soil, and range-forage depletion.

EXPERIMENTAL AREAS

Certain areas, most of which are within the national forests, have been designated as experimental forests. Other areas containing range types have been similarly designated as experimental ranges. These

F-220737

FIGURE 25.—These sheep are grazing quietly and well distributed with ample forage, illustrating good range management. Improved methods of range management are developed by research.

areas have been set aside as outdoor laboratories on which much of the research in forest and range management and in watershed protection is carried out. These experimental areas, of which there are several in each region, are under the general supervision of the forest experiment stations.

The Forest Service has also set aside a series of areas which have been designated as natural areas. The purpose of these is to illustrate or typify virgin conditions of forest or range cover. They are to be maintained in an unmodified condition for research, historical interest, and education. Within the natural areas and also in the experimental forests and ranges, public use is carefully regulated, being limited to educational institutions for research or educational purposes. On the experimental forests and ranges the cutting of timber, the grazing of cattle, and other forms of use are permitted only to the extent that they are part of the research plans for the areas.

CIVILIAN CONSERVATION CORPS

On March 21, 1933, President Roosevelt asked Congress for legislation to help relieve distress, to give men—particularly young men—a chance for healthful employment and to accomplish constructive conservation work in our vast Federal, State, and private forest and park properties. Congress enacted that legislation, and on April 5 the President appointed a Director of Emergency Conservation Work.

The Civilian Conservation Corps was created by the act of March 31, 1933, and within a few days 25,000 men were enrolled. By April 18 the first camp, near Luray, Va., in the George Washington National Forest, was occupied. In 3 months more than 300,000 men had been enrolled.

F-281486

FIGURE 26.—Boys of the C. C. C. fighting a forest fire in Oregon.

This enrollment figure has varied. On October 1, 1935, it had reached a high mark of 500,000 men, working in more than 2,400 camps in every State in the Union and in Alaska, Puerto Rico, Hawaii, and the Virgin Islands. The corps was later reduced to normal strength of 350,000. Most of the camps were assigned to work projects under the jurisdiction of the Department of Agriculture, the remainder under the Department of the Interior. Of the agriculture camps, the greater number have been under the general supervision of the Forest Service, operating on national forests, State forests, and private forest lands.

In addition to these two Federal Departments, the Emergency Conservation Work program as established called for the collaboration of two others—the Department of Labor to direct the enrollment of the men, and the War Department to transport, feed, and clothe the men and to operate the camps.

All forestry projects of the C. C. C. camps on National, State, or private forest lands are supervised by the Forest Service, which plans

the projects and supervises the execution of the work. For those camps on State and private forest lands, supervision is carried on through the State forestry departments.

The C. C. C. program as conceived in 1933 embodied two major purposes: Restoration of confidence and rebuilding physical health of young men hard hit by the economic depression; and the accomplishment of this through work designed to improve the public values of natural resources. The work has resulted in the protection, development, and improvement of existing forests, prevention of soil erosion and flood damage, the spread of knowledge of soil-erosion control and good forestry measures, and the establishment of new forests through protection and reforestation. The Forest Service estimated that in 4 years its program was advanced 15 to 20 years by the emergency conservation work.

Accomplishments of the C. C. C. on forest lands include:

1. Protecting the forests against fire. This involved the building of thousands of miles of telephone lines, the opening up of thousands of miles of firebreaks through forested areas, and the clearing of thousands of miles of roadsides and trailsides as a fire-prevention measure; the construction of many hundreds of lookout towers for fire detection; and the reduction of fire hazards on more than a million acres.

2. Campaigns to control rodent destruction (important on many western national forests), and against losses caused by insects and tree and plant diseases, notably the gypsy moth, white-pine blister rust, and Dutch Elm disease, covering millions of acres.

3. Construction of many thousand miles of service roads and truck trails through timbered areas, principally for fire protection.

4. Forest stand improvement work completed over several million acres.

5. Nearly 875,000,000 trees planted on denuded areas or eroding lands up to January 1, 1937.

6. Improvement of national-forest ranges through revegetation, eradication of poisonous and other harmful plants from many thousand acres, and construction of reservoirs and watering places for stock, and of thousands of miles of stock fence.

7. Improvement of public campgrounds, the development of several thousand wells and springs and of many lakes, ponds, and beaches, as well as the construction of more than a thousand dams for recreational use. Of interest to recreationists and of importance to wildlife are the several thousand ponds for fish and birds constructed by the C. C. C.

8. Control of erosion and destructive water flow on thousands of acres by planting or revegetation of eroding areas following construction of check dams and other minor engineering works in gullies.

Other work done by the C. C. C. includes timber-estimating surveys; construction of foot, horse, vehicle, and stock bridges; erection of tool houses and boxes, and other structures necessary to national-forest administration, protection, and development.

In addition to construction work, the C. C. C. spent hundreds of thousands of man-days in maintenance work on telephone lines, firebreaks, and truck trails, and as organized fire-suppression crews in fighting fire.

The training received by C. C. C. enrollees in a wide variety of forest work and special techniques has resulted in the advancement of many to the rank of leader, and often into positions on the supervisory staffs. Following creation by the President of a new civil-service rating—junior assistant to technician—several hundred former C. C. C. youths were appointed to this position. This move represented an opportunity to ambitious and able young men to advance within the corps itself. It carries a substantial raise in pay

over that received by enrollees. In addition, many thousands of former enrollees have left the corps in better physical condition and with a background of valuable experience and training to take positions in private industry and business.

OTHER EMERGENCY PROJECTS

The Forest Service has also contributed substantially to the relief of unemployed citizens through allotments of funds under various other emergency relief designations. A large quantity of useful work on the national forests has been done in practically every State. Work projects have included the construction of highways, roads, trails, bridges, dams, telephone lines, fire-lookout towers, and buildings of various sorts; also much work has been done by relief employees in the development of recreation facilities, forest culture, rodent control, and range improvement and surveys.

F-302571

FIGURE 27.—Crew of C. C. C. members planting seedlings on Hinkle Run, Monongahela National Forest, W. Va.

Large additions to the national forests have been made under the various relief programs. Purchase of these areas and the subsequent improvement and protection work done on them have also provided large-scale employment of men. By means of these programs, public forest properties have been greatly improved and men employed on healthful work, noncompetitive with private industry.

INFORMATION ON FORESTRY

The Forest Service places at the service of the public its fund of information about forestry, accumulated from its experience of more than a third of a century in managing forest properties, and from its forest research. It publishes its findings in helpful, practical bulletins, reports, and statements. Its experts also furnish advice and cooperation by personal contact with many individuals.

Timberland owners, farmers who have woodlands, other small landowners, livestock producers, and persons wishing information on such subjects as tree planting for timber production, windbreaks, shelterbelts, range management, and control of erosion are given such data as the Service has available, applicable to their special needs.

Information on such matters as the properties and uses of wood, wood seasoning and preservative treatment, and methods of obtaining or utilizing forest products of any kind is obtainable from the Forest Products Laboratory where investigations of this character are centered.

The Forest Service has a large collection of photographs showing forest conditions and illustrative of forest utilization and forest work generally in all parts of the United States. This collection is open to the public for inspection. Photographic prints, lantern slides, and forest maps are furnished for educational purposes, through loan or sale.

Material for use in visual education may be borrowed for short periods without cost except for transportation, by schools, libraries, clubs, and other institutions or organizations. This material consists of traveling exhibits, sets of lantern slides, film strips, and motion-picture films. Lists of this material are available upon request.

FOREST SERVICE ORGANIZATION

The administration of the national forests and the conduct of all matters relating to forestry which have been charged to the Department of Agriculture by Congress are, under the direction of the Secretary of Agriculture, in the hands of the Chief of the Forest Service whose office is in Washington, D. C.

In order to prevent delays in the administration of the national forests and to keep closer touch on problems as they arise in the field, the country has been divided into 10 national forest regions with a regional forester in charge of each. Their respective headquarters are located as follows:

Region 1. Northern region (Montana, northeastern Washington, northern Idaho, and northwestern South Dakota), Missoula, Mont.

Region 2. Rocky Mountain region (Colorado, Wyoming, South Dakota, Nebraska, and Oklahoma), Denver, Colo.

Region 3. Southwestern region (Arizona and New Mexico), Albuquerque, N. Mex.

Region 4. Intermountain region (Utah, southern Idaho, western Wyoming, eastern and central Nevada), Ogden, Utah.

Region 5. California region (California and southwestern Nevada), San Francisco, Calif.

Region 6. North Pacific region (Washington and Oregon), Portland, Oreg.

Region 7. Eastern region (Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, and Kentucky), Washington, D. C.

Region 8. Southern region (North Carolina, Tennessee, South Carolina, Georgia, Alabama, Mississippi, Florida, Arkansas, Louisiana, Texas, that portion of Oklahoma east of the Indian meridian, and Puerto Rico), Atlanta, Ga.

Region 9. North Central States region (Michigan, Wisconsin, Minnesota, North Dakota, Iowa, Missouri, Illinois, Indiana, and Ohio), Milwaukee, Wis.

Region 10. Alaska Region, Juneau, Alaska.

The Prairie States forestry project has its headquarters in Lincoln, Nebr.

The group of national forests in each national-forest region is under the direction of the regional forester. His staff generally consists of an associate regional forester and special technicians for each division of the Forest Service work activities.

Each national forest is in charge of a forest supervisor, who plans the work on his forest under the direction of the regional forester and supervises its execution. When the amount of business on a national forest warrants it, the supervisor is assisted by an assistant supervisor, whose duties and authority are delegated to him by his superior. Supervisors and assistant supervisors have to be men of experience in forest work, construction of improvements, livestock management, wildlife development, administration of recreational resources, and in all other lines of work carried on in the national

F-225768

FIGURE 28.—The winter has its seasonal work for the forester. Fremont National Forest, Oreg.

forests; therefore, these positions are always filled by promotion or transfer of experienced men from classified positions in the Forest Service. Supervisors' headquarters are located in towns conveniently situated near the forests.

Junior foresters and junior range examiners are employed in the various subordinate lines of technical and administrative work on the forests under the direction of the supervisor. These positions are filled through technical examinations.

After an apprenticeship period of not less than 2 years, junior foresters who have rendered satisfactory service may be advanced in grade and assigned to such work as examining and mapping forest areas, designating timber to be cut in sales, surveying boundaries, and conducting nursery work and forest planting.

Every national forest is divided into ranger districts, varying in size from 50,000 to 300,000 acres, with a district ranger in charge of each. The rangers are administrators and have supervision over

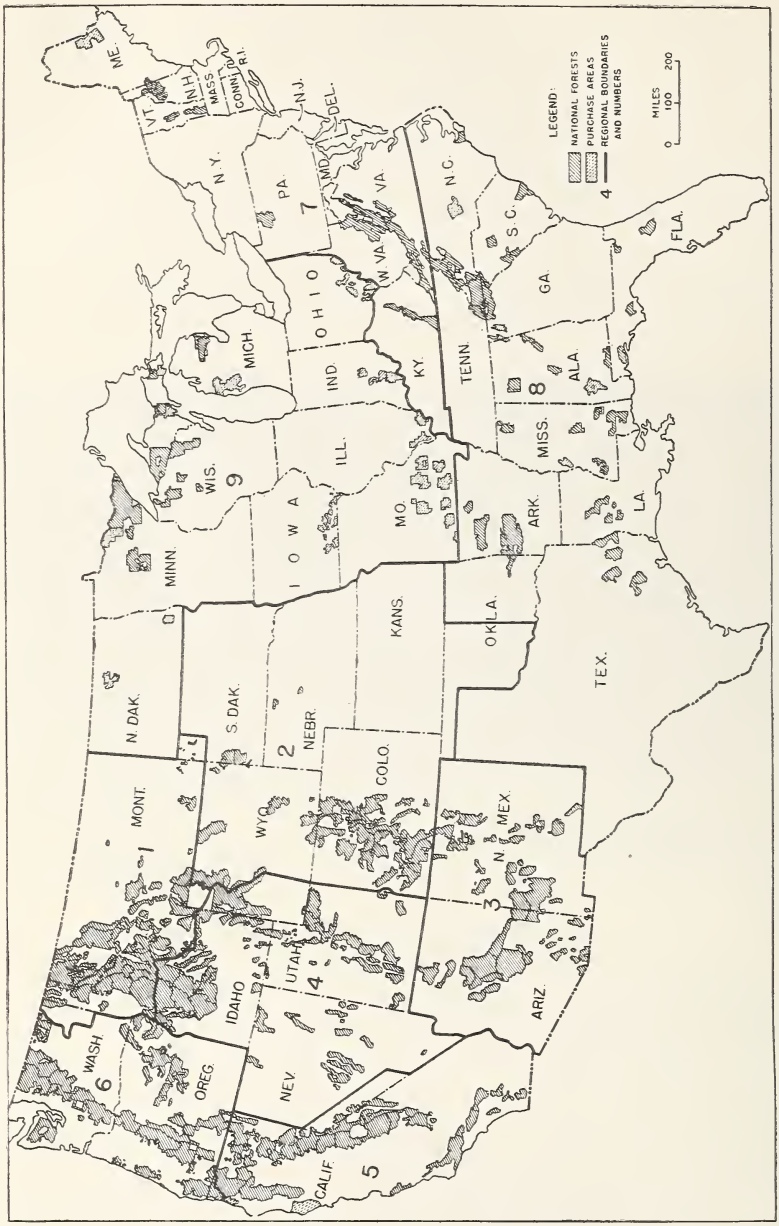


FIGURE 29.—Location of the national forests and purchase areas.

sales, grazing, protection, and use of the resources on their districts. They also direct building of roads, trails, bridges, telephone lines, and other improvements on the forests. Physical soundness and endurance are essential on account of the heavy labor and exposure involved in such work as building improvements and fighting fire. The forest ranger must know how to pack supplies and find food for himself and

his horse in country where it is often scarce. On the Alaska national forests travel is almost entirely by water, and the ranger must add to his other skills that of knowing how to navigate a seagoing launch.

On districts where the work is heavy, the ranger may be assisted by one or more assistant rangers. Ordinarily junior foresters are selected to act as assistant rangers. The position of forest ranger is filled through promotion of qualified employees of the Forest Service who have demonstrated their ability to handle administrative work.

FIGUEE 30.—The forest ranger is an administrator of a huge area of land and carries heavy responsibilities. In order to become familiar with his entire district, he must often make hard trips afield to remote localities.

In addition to the different classes of forest officers mentioned, logging engineers, lumbermen, scalers, planting assistants, engineers, landscape specialists, wildlife specialists, economists, ecologists, etc., are employed on the forest in the work of timber appraisal, cruising, scaling, forest planting and nursery work, and other specialized activities. Like all other permanent employees, they are appointed only after a civil-service examination.

Forest guards are temporary employees appointed during the season of greatest fire danger. They are usually men who are thoroughly familiar with the country in which they are to serve. More than 5,000 forest guards are employed on the national forests each year.

Work of forest research is carried on at the Forest Products Laboratory and at regional forest experiment stations, of which 12 have already been established. Another station has been recently authorized for the Great Plains region but as yet has not been established. The regional stations now in existence are as follows:

Allegheny Forest Experiment Station, Philadelphia, Pa.
Appalachian Forest Experiment Station, Asheville, N. C.
California Forest and Range Experiment Station, Berkeley, Calif.
Central States Forest Experiment Station, Columbus, Ohio.
Intermountain Forest and Range Experiment Station, Ogden, Utah.
Lake States Forest Experiment Station, University Farms, St. Paul, Minn.
Northeastern Forest Experiment Station, New Haven, Conn.
Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont.
Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.
Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Southern Forest Experiment Station, New Orleans, La.
Southwestern Forest and Range Experiment Station, Tucson, Ariz.

Forest research requires a personnel with highly specialized training. As organized the work is supervised and coordinated through the office of the Chief of Forest Research in Washington, D. C. Each of the research divisions—silvics, range, forest products, forest economics, and forest influences—has a staff of men who are experts in their field. Similarly, each of the experiment stations has a director who heads a group of field divisions, including specialists working on various research projects.

High standards are maintained in the selection of Forest Service personnel. All permanent positions are under civil service. Only those who have passed civil-service examinations may be appointed.

In all, the permanent force employed by the Forest Service now numbers approximately 3,300. Of these, about two-thirds are employed on the national forests in the various field positions, and the remainder are engaged in administrative, scientific, and clerical work at the Washington and regional headquarters, the Forest Products Laboratory, and the forest and range experiment stations.

S. GOVERNMENT PRINTING OFFICE: 1938

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 10 cents

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